

CHRISTCHURCH DRAINAGE BOARD**STORM ON 7 JULY 1986****1. INTRODUCTION:**

This report provides a general description of the storm which occurred on Monday, 7 July 1986, and its effect on catchments within the Board's district.

2. DESCRIPTION:**2.1 Meteorological Conditions:**

On Sunday, 6 July 1986, light coastal rain began falling in the Canterbury region. A complex trough of low pressure situated over the central North Island was accompanied by a band of rain. This developed into a large cloud sheet which moved southwards on to the South Island bringing heavy rain to areas exposed to the north-east. The northerly rain was followed by a cold south-westerly and rain for most of Monday, 7 July 1986.

2.1 Rainfall:

Rainfall commenced with a light fall on Sunday morning. A three hour period of more intense rain was followed by the start of the main part of the storm at 3.00 p.m. on Sunday when all the Board's automatic recorders began recording an increase in intensity.

The highest rainfall depths were recorded at Burwood. This was 125 mm, which included 113.7 mm for a 24 hour period. This has a return period of over 20 years.

In comparison, Halswell had the lowest recorded depth with falls of only about a 3 year return period. For Bryndwr the 12 and 24 hour falls were of about 7 and 6 year return period.

A rainfall distribution map is attached. High rainfall areas appear to coincide with the areas observed to have the worst flooding.

Rain gradually eased on Monday night, finally stopping at 10.00 p.m.

Peak rainfall occurred at 4.00 to 6.00 a.m. on Monday.

2.2 Tides:

Measured peak water levels in the Avon - Heathcote Estuary:-

Sunday, 6 July: 5.15 a.m.
5.15 p.m.
Monday, 7 July: 5.30 a.m.
5.45 p.m. (recorded level 10.05 metres)

3. RIVERS:

A general description of the performance of the three river channels is as follows:-

3.1 Heathcote River:

The main channel coped reasonably with peak flows, spilling on to adjoining roadways being minimal. Many hectares of rural low land at Cashmere Valley and Hendersons Road were inundated for a day or two.

3.2 Avon River:

The channel generally coped with peak flows. Some surface flooding occurred in the lower reaches.

3.3 Styx River:

The river channel generally coped well with moderate flood flows. In the lower reaches, parts of the flood plains were used. An overflow into low land on the eastern side south of Brooklands is believed to have occurred near high tide. This is being investigated.

4. WINTERS ROAD PONDING BASIN:

This basin contributed to suppression of peak catchment flow in to the Styx and Avon Rivers by storage of storm runoff. Basin operated to near full capacity (and its performance was monitored throughout by Christchurch Drainage Board staff).

5. URBAN FLOODING:

Urban flooding occurred mainly in the northern part of Christchurch when principal waterways became overloaded.

5.1 Dudley Creek Catchment:

Overloaded in Papanui and St Albans areas causing some damage to properties alongside the creek, and allowing overflows across Thames, Norah Streets to the Flockton Street area.

The Dudley Creek Diversion accepted all floodwaters which reached the diversion point in Philpotts Road and probably made the critical difference in preventing water from entering houses in Flockton Street basin.

There was extensive overflow into the Cranford Street basin.

The overflow path from Cranford Street, to the Flockton Street basin, and the extent of flooding along this path, is shown on the attached sheet "Flooding in Mairehau and St Albans".

Extensive flooding occurred in Westminster Street at the Aylesford Street corner. No. 275 Westminster Street had floodwater through the house.

Side streets, Squire, Archer and Speight, between Aylesford Street and Flockton Street were completely flooded. Floodwater entered most sections off these streets.

5.1.1 Flockton Street Basin:

Most properties within the block from Aylesford Street to Flockton Street and Carrick Street to Warrington Street were flooded. Several houses were within 100 mm of having water enter them (see attached sheet which gives details of flood levels relative to house floor levels for the Flockton Street basin). Five houses were evacuated as a precaution against water levels rising and entering them.

5.1.2 Francis Avenue:

A length of Francis Avenue either side of the Flockton Street invert was completely covered by floodwater. Water entered neighbouring sections as a result.

5.1.3 Hawkesbury Avenue:

There was some street flooding and minor section flooding in Hawkesbury Avenue at the Rutland Street intersection. This flooding was probably made worse by the stormwater work currently being undertaken in Hawkesbury Avenue.

5.2 St Albans Creek Catchment:

The following areas were affected:-

5.2.1 Dover Street:

Dover Street from Edgeware Road to 100 metres past Radnor Street was completely flooded to a depth of 250 mm. Floodwaters entered several sections and flooded some garages. One house, No. 34, is known to have had up to 50 mm of water through it.

5.2.2 Edgeware Road:

At the Edgeware Road, Colombo Street corner, floodwater was across the crown of the road. Several shops in the Village Mall were entered by floodwater. St Albans Creek at the Edgeware Road/Manchester Street culvert was about 100 mm higher than soffit level. These high water levels were causing water to flow south down Cranford Street into the Canon Street catchment.

Further east between Geraldine Street and Hills Road, St Albans Creek on the southern side of Edgeware Road was spilling in to Edgeware Road. It continued to flow east, completely covering the street, and finally re-entered the creek bed on the northern side of Edgeware Road. Flow across Hills Road was confined to the culvert. While properties with the creek flowing through them had water through their gardens, no buildings were affected.

5.3 Edward Avenue (Bings Drain):

Most of Edward Avenue between Allard Street and Cleveland Street was flooded, with floodwater over the crown. A few garages had water through them. Two houses had water within 200 mm of floor level however most were well clear of the flood level reached.

5.4 Upper Frees Creek Catchment:

5.4.1 Heaton Street:

Traffic faced delays due to flooding in Heaton Street between Allister Avenue and Circuit Street. The street was completely covered for about 300 metres to a depth up to 100 mm above the crown. Only minor flooding of sections occurred.

5.4.2 Leinster Road:

The length of Leinster Road from Papanui Road to Allister Avenue was closed to traffic due to the depth and extent of flooding in the street. Over 300 metres of Leinster Road was covered to a depth of 250 mm. Despite the depth of water in the street, no properties were badly affected.

5.5 Canon Street (Northern Drain):

Canon Street between Bishop Street and Sherborne Street was completely flooded to a depth of 250 mm above the crown. The most seriously affected area was between Manchester Street and Sherborne Street. In this block two houses, one of which was evacuated, were within 50 mm of having water above floor level. The Abel Tasman Motel complex was also threatened. Most sections in this area were covered to some extent by floodwaters.

6. **BROOKLANDS SETTLEMENT:**

This area suffered extensive flooding. Portions of Lower Styx Road and Harbour Road were completely covered with up to 200 mm of water. Other properties in the Brooklands settlement were also completely flooded. Most were affected to some extent. In some instances septic tanks were inoperative. Water entered one house in Nirvana Street. Further south four houses near Spencerville Road were surrounded by water.

Harbour Road and Nirvana Street have no stormwater drainage. The local volunteer fire brigade cleared some of the worst affected sections and the Board's maintenance section pumped stormwater from a large area in front of the camping ground.

7. **OTHER AREAS:**

A number of other areas experienced flooding to varying degrees and are listed below. They are streets where flooding was observed by Board staff only and it is not likely to be a complete list of streets actually flooded.

Ranfurly Street	Glenrowan Street	Bramwell Street
Springfield Road	Belmont Street	Coopers Road
Webb Street	Eglington Street	Barclay Place
Lindsay Street	Pembroke Street	Achilles Street
Madras Street	Waratah Street	Leander Street
Creyke Road	Braithwaite Street	Ilam Road
Makora Street	Kain Street	Epsom Road
Middlepark Road	Slater Street	
	Niven Street	
	Woolley Street	

8. **RURAL AREAS:**8.1 **Prestons Road (Karnbachs Drain):**

Land on the north side east of Grimseys Road was flooded. No. 167 Prestons Road, a recently built house on the urban boundary, was flooded to a depth of 30 mm above concrete floor.

8.2 **Styx Catchment:**

Surface flooding to rural areas adjacent to Styx River from Marshland Road to Brooklands.

8.3 **Travis Road:**

Extensive temporary ponding on undeveloped land, north and south of Travis Road occurred, mainly on the eastern side.

8.4 Winters Road:

Ponding, mostly on northern side.

8.5 Snellings Drain Catchment:

Extensive temporary ponding on land west of Greenhaven Drive.

8.6 Marshland Road Area:

Drains ran freely and full during the storm. Some isolated flooding of low areas.

9. SEWAGE OVERFLOW - 336 CRANFORD STREET:

Sewage overflowed from a gully trap and entered in to one flat, causing minor damage. Board staff were called out early on Monday morning and assisted by pumping excess sewage from the sewer main. This problem was considered by the Board in April and an offer was made to isolate the dwellings from the sewer main by pump installations. An acceptance from one of the two owners was received on Friday, 4 July 1986.

10. OPERATION OF SEWERS AND PUMPING STATIONS:

Maintenance staff coped well with the problems of Monday, 7 July 1986. There were no complicating factors, e.g. high winds or trees fallen into streams to introduce special difficulties.

Sewer maintenance staff attended to flooding complaints until late on Sunday night and were out again from about 2.30 a.m. onwards on the Monday morning. Senior staff from both Civil Maintenance and the Mechanical and Electrical Departments were called at about 5.00 a.m. The on call pumping station patrolman was out from about 1.00 a.m. onwards.

Both sewage and stormwater pumping systems worked very well. There were no pump breakdowns and only a very small number of motor overload conditions which were able to be readily reset. At 9.00 a.m. on Monday a total of 37 pumping stations were in "high water" condition, with 12 still being so 24 hours later. Stations No. 1 (Pages Road) and No. 15 (Dyers Road) both had all pumps running at full speed. All pumps at No. 205 stormwater piping station (Horseshoe Lake) ran from early morning until evening.

The work carried out on several stormwater pumping stations since 13 March 1986 flood was obviously worthwhile. The only station needing some further checking and tuning is No. 203, Wairoa Street, Bexley.

No particular problems emerged at the Christchurch Treatment Works in spite of the very high flow rates. A member of the electrical staff from Tuam Street manned the busy pumping station alarm monitor at the Christchurch Treatment Works.

Once again, the heavy rain cause ingress of stormwater in to foul water sewers which subsequently became gorged in very many areas. Sewage overflows on to private property occurred at at least 33 addresses. The number of sewer blockages was reasonably high, and the last of these was cleared by about 9.00 p.m. on Monday. Clean up operations around private property were substantially completed the following day.

A serious blockage occurred in the outfall of Donalds Drain into the Styx River. An access culvert alongside Gardiners Road became completely blocked by gorse cuttings from a nearby hedge which were not able to be removed until Wednesday, 9 July, in spite of continuous efforts during daylight hours. This blockage caused substantial delays in the draining of floodwater from the area north-west of Tullett Park by Gardiners Road.

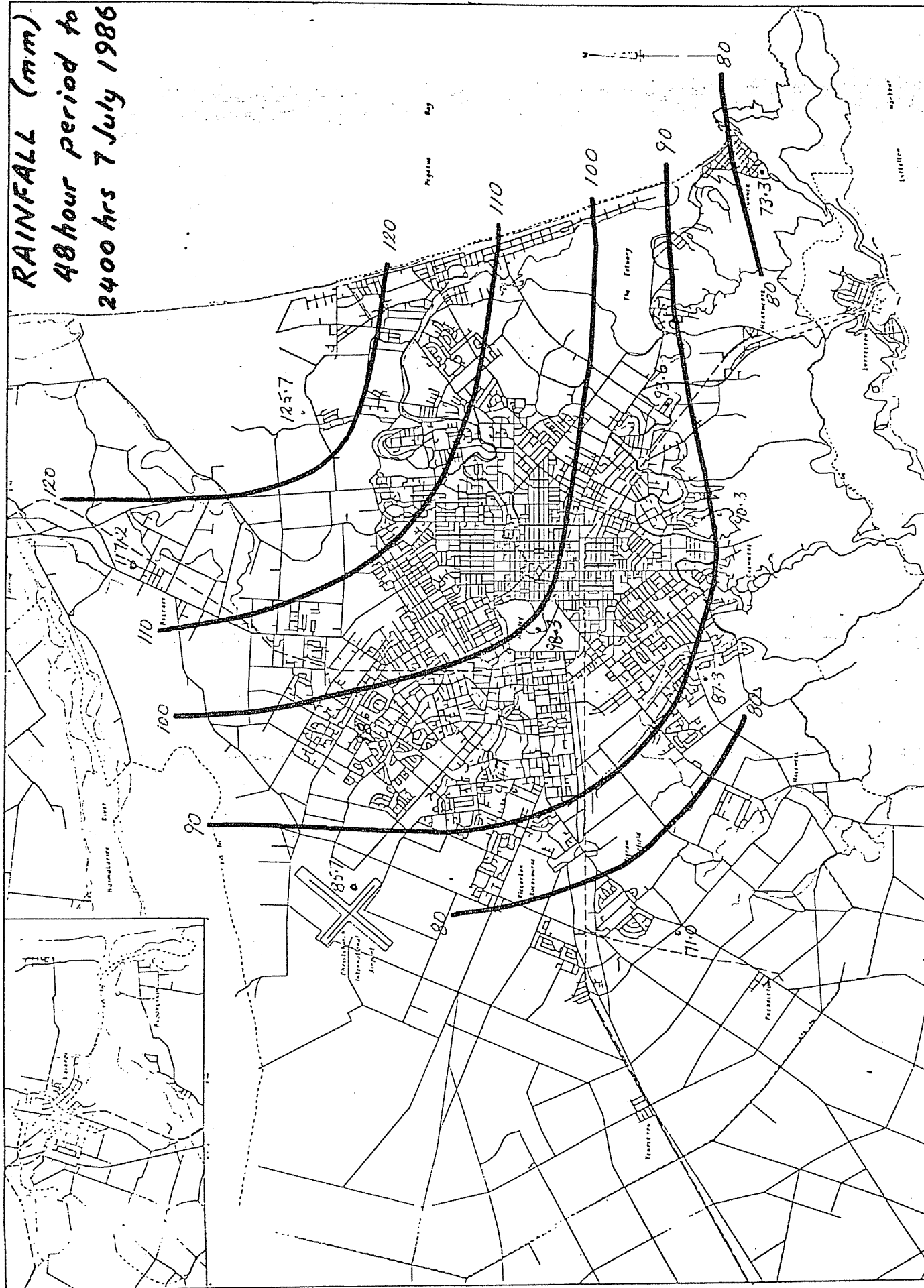
11. **GENERAL COMMENTS:**

The storm produced flooding in mainly the northern part of the Board's district. The worst affected urban areas were in St Albans. However, in Brooklands, a relatively new part of the district, relatively bad flooding also occurred.

The flooding in the Flockton Street area, Upper Dudley Creek, St Albans and Brooklands was closely monitored. Valuable additional information on these areas was gained.

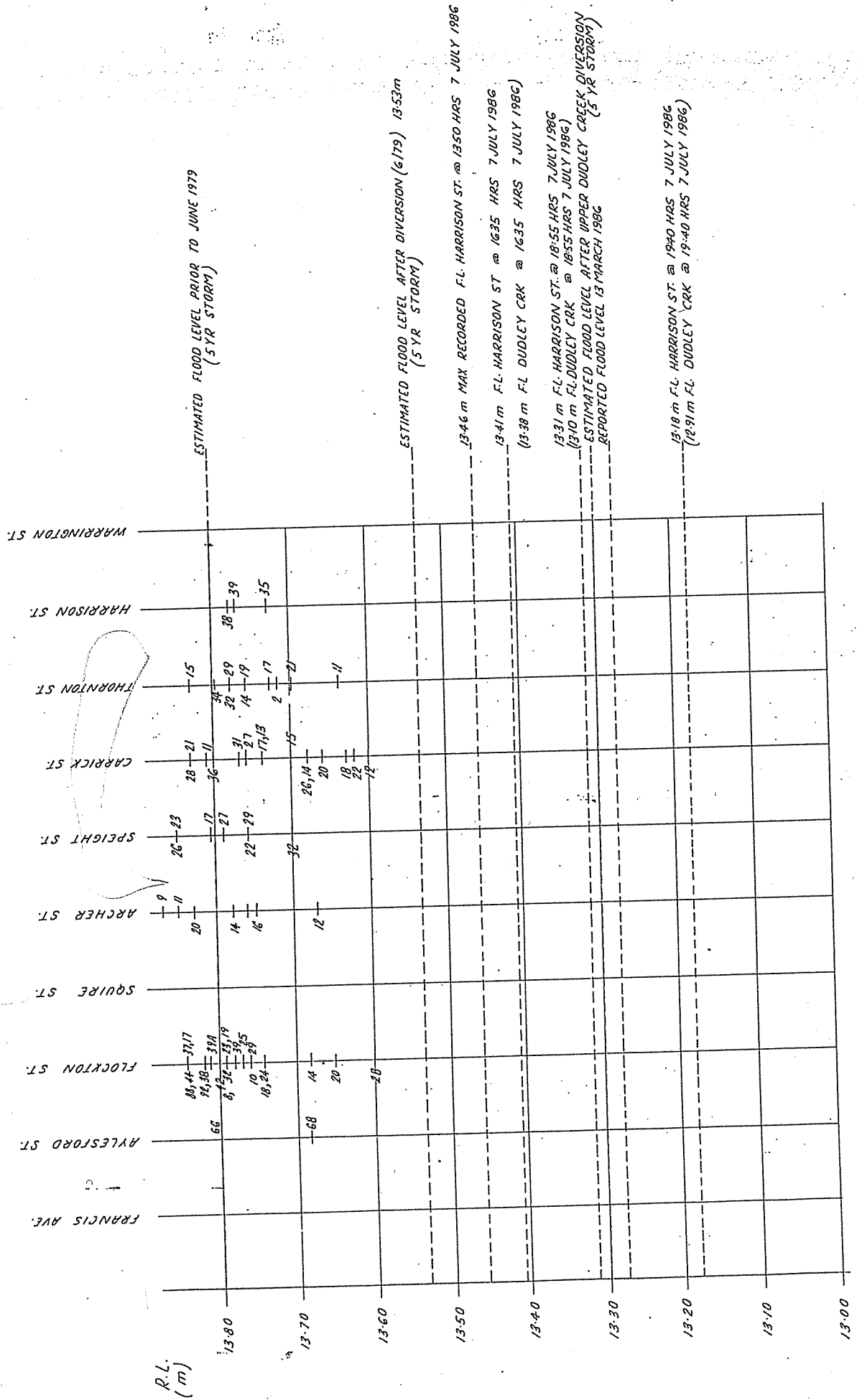
In general the Board's stormwater system coped well. There were a relatively high number of sewer overflows in uncontrolled locations and one house suffered entry.

RAINFALL (mm)
48 hour period to
2400 hrs 7 July 1986



Prepared by :- INVESTIGATIONS AND RESEARCH DIVISION
CHRISTCHURCH DRAINAGE BOARD 11 JULY 1986

FLOCKTON STREET BASIN



HOUSE FLOOR LEVELS
 * (INFORMATION FROM PLAN N° 101366; SURVEY 10/79 L.B. 678, 337)



FLOODING IN MAIREHAU AND ST ALBANS

7 July 1986

